Claims

1. A method for defining the relationship between frequency and amplitude of a pulse function for acting on a data stream for transmission in a
5   telecommunications system in accordance with a predetermined modulation scheme, the method comprising:

  defining desired cost parameters; and

  defining the amplitude of the pulse function over a range of frequencies in dependence on the desired cost parameters.

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2. A method according to claim 1 wherein the amplitude of the pulse function over a range of frequencies is defined in an iterative process in which the pulse function is altered and the cost parameters determined until an acceptable balance of cost parameters is achieved.

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3. A method according to claim 1 or 2 wherein the method comprises the step of weighting the respective cost parameters.

4. A method according to claim 3 wherein an acceptable balance between
20   the cost parameters is achieved by optimizing the respective costs with the respective weightings.

5. A method according to claim 4 wherein the optimization is performed using an optimizer computer programme.

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6. A method according to any one of the preceding claims wherein the cost parameters are selected from one or more of the group including power efficiency, spectral efficiency, bit error rate, AFC, Nyquist, and energy.

7.   A pulse function generator for converting a data stream in accordance with a pulse function shaped in accordance with the relationship defined by the method of any preceding claim.

5   8.   A modulator for providing a signal for transmission in a telecommunication system comprising:

means for shaping a data stream in accordance with the pulse function generator of claim 7.

10   9.   A modulator according to claim 8 wherein the means for shaping comprises a filter.

10.   A modulator according to claim 8 wherein the means for shaping comprises a look-up table.

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11.   A transceiver for a communication device comprising a modulator in accordance with any one of claims 8 to 10 and a demodulator.

12.   A communication device operable in communication system comprising

20   a transceiver according to claim 11.

13.   A modulator for providing a signal for transmission in a TDMA telecommunications system in which a channel is a combination of frequency and timeslot in accordance with a predetermined modulation scheme wherein

25   the data stream is shaped in accordance with a pulse generator of claim 7 prior to Modulation with a carrier signal.

14.   A modulator for providing a signal for transmission in a CDMA telecommunications system in accordance with a predetermined modulation

scheme, wherein the data stream is shaped in accordance with a pulse generator of claim 7 prior to modulation with a carrier signal.

15. A modulator is claimed in claim 13 or 14, wherein the modulation scheme is MSK.

16. A modulator as claimed in claim 13 or 14, wherein the modulation scheme is MSK.

17. A dual mode communication device operable in a first mode in a TDMA telecommunications system in which a channel is a combination of frequency and timeslot and a second mode in a CDMA telecommunications system, comprising a modulator for modulating a data stream with a carrier signal in accordance with a predetermined modulation scheme in both the first and second modes of operation and a pulse function generator for shaping a data stream in accordance with respective pulse functions responsive to the mode of operation of the radio telephone.

18. A dual mode communication device operable in a first mode when a first set of cost parameters are desired and in a second mode when a second set of cost parameters are desired, the radiotelephone comprising:
a first pulse function generator for converting a data stream in accordance with a pulse function shaped in dependence on the first set of desired cost parameters;
a second pulse function generator for converting a data stream in accordance with a pulse function shaped in dependence on the second set of desired cost parameters; and
means for selecting the pulse function generator in accordance with the mode of operation of the phone;

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wherein at least one of the pulse functions is shaped in accordance with the relationship defined by the method of any of claims 1 to 6.

19. A communication device as claimed in claim 18, which is operable at a

5   first data rate in the first mode and a second data rate in the second mode.

20. A communication device as claimed in claim 19, wherein the first data rate supports voice applications and the second data rate supports data applications.

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21. A communication device as claimed in any of claims 18 to 21, operable in a TDMA telecommunications system.

22. A communication device as claimed in any of claims 18 to 20 , wherein

15   the first pulse function generator generates a pulse of Gaussian shape.

23. A dual mode communication device operable in a first mode when a first set of cost parameters are desired and in a second mode when a second set of cost parameters are desired, the radiotelephone comprising:

20   a modulator for modulating a data stream with a carrier signal in accordance with a predetermined modulation scheme in both the first and second modes of operation;

          a first pulse function generator for shaping a data stream in accordance with a pulse function shaped in dependence on the first set of desired cost

25   parameters;

          a second pulse function generator for shaping a data stream in accordance with a pulse function shaped in dependence on the second set of desired cost parameters; and

          means for selecting the pulse function generator in accordance with the

30   mode of operation of the phone.

24.   A method for selecting a modulation scheme for a communication

system, the method comprising:

       defining a pulse function for a first modulation scheme in accordance

5   with the method as claimed in any of claims 1 to 7;

       defining a pulse function for a second modulation scheme for the same

desired cost parameters;

       determining the resultant cost parameters for each scheme; and

       selecting the modulation scheme which gives good resultant cost

10   parameters given the desired ones.

25.   A method for defining the relationship between frequency and

amplitude of a pulse function for acting on a data stream for transmission in a

communication system in accordance with a modulation scheme, substantially

15   as hereinbefore described with reference to, and/or as illustrated in any one,

or any combination of the figures of the accompanying drawings.

26.   A method for selecting a modulation scheme substantially as

hereinbefore described with reference to, and/or as illustrated in any one, or

20   any combination of the figures of the accompanying drawings.

27.   A pulse function generator substantially as hereinbefore described with

reference to, and/or as illustrated in any one, or any combination of the figures

of the accompanying drawings.

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28.   A modulator for providing a signal for transmission in a communication

system substantially as hereinbefore described with reference to, and/or as

illustrated in any one, or any combination of the figures of the accompanying

drawings.

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29.   A transmitter and/or receiver for a radiotelephone substantially as hereinbefore described with reference to, and/or as illustrated in any one, or any combination of the figures of the accompanying drawings.

5   30.   A radiotelephone substantially as hereinbefore described with reference to, and/or as illustrated in any one, or any combination of the figures of the accompanying drawings.

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